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Zeng, Jing ; Schäfer, Mike S

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ARTICLE



Conceptualizing “Dark Platforms”. Covid-19-Related Conspiracy Theories on 8kun and Gab

Jing Zeng  and Mike S. Schäfer 

Department of Communication and Media Research, University of Zurich, Zurich, Switzerland

ABSTRACT

This study investigates how COVID-19-related content, especially conspiracy theories, is communicated on “dark platforms” — digital platforms that are less regulated and moderated, hence can be used for hosting content and content creators that may not be tolerated by their more mainstream counterparts. The objective of this study is two-fold: First, it introduces the concept of dark platforms, which differ from their mainstream counterparts in terms of content governance, user-base and technological infrastructure. Second, using 8kun and Gab as examples, this study investigates how the ongoing COVID-19 pandemic has been communicated on dark platforms, with a focus on conspiracy theories. Over 60,000 COVID-19-related posts were studied to identify the most prominent conspiracy theories, their themes, and the actors who promoted them, as well as the broader information ecosystem through network analysis. While pressure on social media to deplatform conspiracy theorists continues to grow, we argue that more research needs to be done to critically investigate the impacts of further marginalizing such groups. To this end, the concept of dark platform as can serve as a heuristic device for researching a wider range of fringe platforms.

KEYWORDS

conspiracy theory; dark participation; Gab; 8kun; 8chan; COVID-19

Introduction

The COVID-19 pandemic has been accompanied by a corresponding “infodemic”, which has permeated the online realm with a plethora of conspiracy theories and misinformation (United Nations 2020). This study investigates how COVID-19-related content, especially conspiracy theories, is communicated on “dark platforms”. We define dark platforms as digital platforms that are less regulated and moderated, hence can be used for hosting content and content creators that may not be tolerated by their more mainstream counterparts. As we will discuss in more detail in the next section, dark platforms have three characteristics: *content liberation*, *exile congregation*, and *infrastructure ostracization*. Examples of such platforms include established imageboards (e.g. 4chan and 8kun) and emerging new social media sites (e.g. Parler and Gab).

CONTACT Jing Zeng  zengjing310@gmail.com  j.zeng@ikmz.uzh.ch

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In this study we define conspiracy theories as proposed explanations of events or practices that make reference to the secret machinations of powerful individuals or institutions (Goertzel 1994; Keeley 1999; Uscinski 2019). Conspiracy theories used to be considered as anomalies, but over time they have become increasingly normalized in public discourse and media (Aupers 2012; Uscinski 2019). During the pandemic, for instance, conspiracy theories claiming that the COVID-19 virus was bio-engineered were utilized by both the Trump administration and Chinese politicians as a discursive weapon to attack one another (Zeng and Chan 2021).

Factors contributing to the prevalence of conspiracy theories are manifold, and this study is particularly interested in the role played by digital platforms where conspiracy theorists congregate. As demonstrated by a fast-growing body of scholarship, social media is playing an increasingly large role in amplifying the visibility of conspiracy theories (e.g. Broniatowski et al. 2018; Bruns, Harrington, and Hurcombe 2020; Marwick and Lewis 2017). In response to growing pressure from the public and regulators, major social media platforms have begun to systematically crack down on conspiracy theory-related content and influential conspiracy theory personalities (Mahl, Zeng, and Schäfer 2021). This trend is turning dark platforms into the new venues for conspiracy theorists to congregate. Dark platforms offer more freedom and largely abstain from content moderation, which makes them an attractive refuge for conspiracy theorists and other de-platformed individuals. Despite the fast-growing influence of and threats posed by dark platforms, they remain largely under-researched. This study seeks to fill this void through introducing the concept of dark platforms, and through investigating how they are used to communicate and theorizing conspiratorial narratives about COVID-19.

Dark Platforms

Defining Characteristics

Dark platforms share basic functionalities with their mainstream counterparts. For instance, they provide the communicative architecture that allows users to create, distribute, and engage with content in various modalities. To discuss dark platforms' distinctive characteristics, we adapt the framework proposed by Nieborg and Poell (2018) and focus on three dimensions of platforms: governance, user, and technological infrastructure. Following this logic, the key characteristics of dark platforms can be summarized as *content liberation*, *exile congregation*, and *infrastructure ostracization*.

To begin with, dark platforms practice, and often celebrate, *content liberation*. In comparison to mainstream platforms, communication on dark platforms is less regulated. Unlike prominent technology companies, who are increasingly under pressure to expand their policies of content moderation (Gillespie 2018), dark platforms have gained popularity in recent years by promoting their image as “defenders of the free flow of information” (del Castillo 2018). From conspiracy theories to alt-right commentary, from coordinated trolling to racist hate-speech, toxic information is widely promulgated on dark platforms (Marwick and Lewis 2017; Thibault 2016; Tuters, Jokubauskaitė, and Bach 2018).

Dark platforms offer *exile congregation*. As major technology companies continue to crack down on perceived harmful content and its creators, expelled “digital refugees” tend to migrate to the dark corners of the Internet. It is important to point out that

because platform governance varies depending upon the social contexts, who constitutes a digital refugee also varies. Although platform regulation in Western democracies has now focussed on deceptive information, hate speech, and far-right content, authoritarian regimes often coerce online platforms to redact users who disagree with or criticize the ruling power (Zeng, Chan, and Fu 2017).

Dark platforms are also characterized by *infrastructure ostracization*. For example, far-right activists and conspiracy theorists have become a regular target for deplatformisation, which refers to the action taken by technology companies to prohibit controversial entities from accessing certain services (Rogers 2020; del Castillo 2018). Google and Apple, for example, deplatformed far-right radio host Alex Jones' Infowars app by removing it from their app stores; Visa and PayPal deplatformed the controversial microblogging service, Gab, so it can no longer receive money through their services. This trend has fostered the emergence of a parallel darker ecosystem of content distribution and monetization. For instance, demonetized video content creators migrate to YouTube's dark equivalent, BitChute, where they can receive "tips" from their viewers directly. Similarly, instead of using Visa or PayPal to receive money, Gab lets its users donate with Bitcoin.

The concept of dark platforms provides a heuristic device for researching digital platforms that are often marginalized in social media scholarship. To effectively apply this concept, some conceptual clarification over our usage of "dark" is necessary.

First, *"dark" is not inaccessible*. Dark platforms are different to the "dark web". Content on the dark web is typically accessed anonymously through crypto-networks. In contrast, dark platforms belong to the clear web—the publicly accessible internet. Another concept related to dark platforms is the "dark social" (Al-Rawi 2019; Swart, Peters, and Broersma 2018), which is mostly used to study information exchange in semi-private space (e.g. private Facebook or WhatsApp groups) and encrypted messaging communication (e.g. Telegram). Dark platforms discussed in this article go beyond private/semi-private communication locales and include publicly accessible sites. Wherein both the "dark web" and the "dark social" emphasize the various degrees of inaccessibility caused by technological architecture, our conceptualization of "dark" underlines under-visibility or intended "silosociality" (Abidin 2021, 4).

Second, *there are different shades of "dark"*. To introduce the concept of dark platforms is to move away from a dichotomous differentiation of mainstream and alternative platforms. The growing impact of dark platforms makes such dichotomy particularly problematic, as it downplays the significance of the latter. In contrast, the concept of dark platforms emphasizes that the degree to which a platform is alternative or secretive—its shade of darkness—is contextual and contingent. For instance, although YouTube and Twitter are perceived as being mainstream platforms in most countries, they could be on the "dark" spectrum in other countries (e.g. China where these platforms are officially banned).

Third, *"dark" is not a normative term*. Despite the negative connotation sometimes associated with "dark", our use of the term is not pejorative. We use it metaphorically to depict the arcane and obscure nature of certain platforms and their disarticulation from regulatory systems. While in this article we discussed exclusively virulent forms of information, the concept of dark platforms can also be applied to researching

communication that has positive impacts. For instance, under authoritative regimes where censorship of dissenting opinions is vigorous, dark platforms may operate outside the spotlight of governmental censorship; thus, they might function as an arena to protect dissenting voices.

Dark Participation in Conspiracy Theorising

New communication technologies, especially social media, have boosted the public's willingness and ability to question authoritative truth claims, and fostered the emergence of participatory sense-making. Although earlier studies of participatory culture have highlighted its progressive and democratizing potential, more recent scholarship has shifted its focus to the disruptive effects of citizen participation on digital platforms (De Vreese 2021, Westlund 2021). For instance, communication scholar Thorsten Quandt (2018) introduced the concept of *dark participation*, a critique of the idealization of citizen participation and a call for avoiding "one-sidedness both in the early debate on participation and its much darker counterpart as of recently" (Quandt 2021, 86). Using examples such as trolling, hate speech, and strategic disinformation, Quandt (2018, 40) captured the "negative, selfish or even deeply sinister" aspects of citizen participation.

The development and spread of conspiracy theories in the digital space is another form of dark participation. Conspiracy theories are a sense-making process that emerge in the context of uncertainty and perceived risks (Van Prooijen and Jostmann 2013). The affordances of new communication technologies, such as dark platforms, allow individuals believing the same theories to participate in crowd-sourcing "evidence", as well as in further "converting" more believers. Like other forms of dark participation, to develop and propagate conspiracy theories can also be highly disruptive. Conspiratorial narratives promote counter-epistemic positions that reject the journalistic and scientific paradigm (Mede and Schäfer 2020). In the context of a pandemic, they can hamper public health responses and lead to unlawful conduct. For instance, in 2020, conspiracy claims linked the COVID-19 virus to the nefarious machinations of the World Health Organization (WHO) and the Gates Foundation flourished on 8kun and 4chan, and eventually inspired certain members of these imageboards to hack and release of thousands of credentials (e.g. emails and passwords) from the two organizations (Mekhennet and Timberg 2020).

The damaging consequence of online conspiracy theories makes it vital to empirically interrogate the role of different digital platforms. While many studies have discussed the impacts of major social media in propagating COVID-19-related conspiracy theories (e.g. Ahmed et al. 2020; Bruns, Harrington, and Hurcombe 2020; Cinelli, Quattrocioni, and Galeazzi 2020; Yang et al. 2020), little is known about the prevalent conspiracy theories and their propagators on dark platforms. To answer these questions, this study asks:

RQ1: How prevalent are different COVID-19-related conspiracy theories on dark platforms?

RQ2: Who are the most influential actors propagating COVID-19-related information, including conspiracy theories?

In a recent commentary on the concept of dark participation, Westlund (2021, 212) pointed out that the prevalence of dark participation should be examined as

the interplay of activities between diverse actors, technological actants, and audience. As implied by this remark, studies of dark participation should acknowledge, as well as be situated in, a complex media ecosystem. In the context of the current study, it requires investigating how dark platforms are situated in the wider information system and how cross-platform information curation and sensemaking takes place. Dark platforms are often depicted as isolated venues engaging in antisocial activities, and they are given labels, such as “the underbelly of the Internet” (Chandrasekharan et al. 2017, 3178) or the “peripheries of the Web” (Thibault 2016, 23). Rather than solely focussing on their deviance and distance, we are also interested in understanding how dark platforms operate as part of the wider communication ecology. Using the example of COVID-19-related conspiracy theories, the third research question we asked is:

RQ3: What are the key information sources used in the discussion and conspiracy theorising of COVID-19?

Methodology

Platform Selection

For this case study on COVID-19 conspiracy theories, we used 8kun and Gab as examples of dark platforms. These two platforms were selected because they embody the three characteristics of dark platforms we discussed in the previous section, and because they are both closely linked to conspiracy theories.

8kun is an anonymous imageboard previously known as 8chan. 8chan had long been known for its far-right extremist, racist and violence-endorsing content, and its links to multiple mass shootings led to its removal from the clear web in August 2019 (Roose 2019). Three months later, through a Russian hosting company, 8chan re-emerged under the new name: 8kun. One primary difference between 8chan and 8kun is the latter’s removal of the most notorious “/pol/” board, which was known to host some of the most toxic content on the site. Instead, as 8chan creator Fredrick Brennan noted, 8kun now focuses strongly on its “/qresearch/” board dedicated to QAnon conspiracy theory (Glaser 2019). QAnon is a meta-conspiratorial narrative that knits together a wide range of conspiracy theories (Zuckerman 2019, 2). The eponymous “Q” is an anonymous alleged political insider who claims that Donald Trump is battling a cabal of shadow groups including US Democratic Party, business tycoons and Hollywood celebrities who secretly rule the world and engage in activities such as satanic rituals, paedophilia and cannibalism. Through 8chan and 8kun, “Q” provides his followers—the Anons—with clues about how to fight this cabal.

The second dark platform we analysed, Gab, is a micro-blogging service launched in 2016 as an alternative to Twitter. A self-described “home of free speech online” (Gab 2020a), the platform has accumulated over 1,157,000 registered accounts and 3.7 million monthly visitors from around the world (Gab 2020b). Similar to 8kun, conspiracy theories, hate speech, and alt-right content flourish on the site (Kalmar, Stevens, and Worby 2018; Zannettou et al. 2017; Zhou et al. 2019).

Data Collection

As discussed in the previous section, “/qresearch/” is the most conspiracy theory-rich board on 8kun and, therefore, the most relevant to our interests. Consequently, our data collection on 8kun focussed exclusively on this board. COVID-19-related content from this board was retrieved through QResear: a search tool for 8kun’s “/qresearch/” board. With the keyword, “covid”, we collected 30,552 posts that were published between February and July 2020.

Even though Gab has application programming interfaces (APIs) through which registered users can collect posts using account names and hashtags, there is no official documentation for these APIs (Kalmar, Stevens, and Worby 2018; Zannettou et al. 2017). In this study, we developed scripts to send API requests based on garc, a Python library for collecting JavaScript Object Notation (JSON) data from Gab.com (Stevens 2020). We conducted a hashtag-search to retrieve metadata of Gab posts, or gabs. The terms we used for our data collection include “#covid19”, “#covid_19”, “#coronavirus”, “#chinavirus”, “#chinesevirus” and “#wuhanvirus”¹. In total, 30,084 gabs published between January and July 2020 were collected.

Data Analysis

Content Analysis

It is methodologically challenging to identify conspiracy theories from 8kun and Gab posts. On the one hand, many posts do not share conspiracy theories directly in the post; rather, they point to external articles or videos. This requires researchers to manually inspect the cited sources to make sense of the post. On the other hand, the intrinsic epistemological complexity of conspiracy theories makes it particularly challenging to develop structural coding categories. For instance, different conspiratorial narratives can overlap or mutually link to various “tent theories”, which cover a range of conspiracy theories. Thus, to identify and build connections between different narratives it is essential to be familiar with existing conspiracy theories, especially their relationship and terminologies.

To develop a codebook for content analysis, one expert coder with expertise in conspiracy theories on dark platforms inductively inspected and annotated randomly sampled posts from both platforms to identify the common themes appearing in the datasets. When reaching the *saturation point*² (Charmaz 2014) after annotating 400 posts, two non-conspiracy theory themes (news updates on COVID-19 and medical information) and four general conspiracy theory themes were identified. The four conspiracy theories theme categories with their 11 subcategories are explained with examples in Table 1.

Because conspiracy theory themes are non-mutually exclusive, each post can be assigned multiple categories or subcategories, as appropriate. For instance, the Gab post shown in Figure 1 claims that the virus was made by Bill Gates, and that he teamed up with Elon Musk to develop a COVID-19 vaccine and to roll out 5G satellites. This example includes three conspiracy theory themes: bio-engineering, 5G, and vaccination. Two independent coders were assigned to analyse 900 randomly sampled

Table 1. COVID-19-related conspiracy theories with example posts.

	Subcategory	Example post
Hoax	COVID-19 pandemic is an anti-Trump plot	Governors sent COVID patients to nursing homes in violation of federal guidelines, to increase the death count, prolong the "epidemic," and justify draconian measures in an attempt to derail 2020 election. ... more evidence that the coronavirus is nothing but a politically motivated hoax, designed to deliberately tank the stock market, and keep Trump from re-election? Look no further than this lying liberal
	COVID-19 pandemic is a plot for global governance or New World Order	... this isn't about a cold virus. This is about collapsing the economic structure, cashless society, ID chips, mandatory vaccines, 5G, social credit systems, all linked into technology controlled by the government. #CoronaHoax #COVID is not a killer. #Lockdown is political move towards #New #World #Order.
	General claims that the severity of the virus is exaggerated	Hoax. It's a common virus and we're seeing a new strain that's coupled with possible SARS symptoms ... CORONAVIRUS HOAXERS CAUGHT IN THE ACT. Coronavirus test sites lying about huge line-ups of people waiting to be tested.
5G	5G assists or activates the spread the COVID-19	He [Trump] knows that it's [corona virus] AI-assisted. He knows that it's 5G-assisted, COVID-19 19 virus is artificial intelligence assisted. 5G towers actually open up people's cells to receive viruses, which would explain why Wuhan, China, which went live with 5G late last year, became the epicentre of the outbreak.
	5G caused sickness and deaths are taken as COVID-19 cases	Dr CHARLES LIEBER created the Wuhan Corona virus and developed the Bioelectric Nanotech that enters human cells to respond to 5G. Both have the Same Symptoms, so 5G deaths can be falsely blamed on the Flu-like Coronavirus. Note that coronavirus patients are already being observed with neuropsychiatric effects, testicular damage and oxidative stress, three of the symptoms of 5G exposure.
Bio-Engineered	COVID-19 is a bio-weapon developed by China	Bart Sibrel ... has a theory that Covid-19 was an accidental bio-weapon released. A Must-see Video on The Wuhan Virus proving the Chinese attacked the entire world!
	COVID-19 is engineered for the goal depopulation	The Wuhan coronavirus pandemic is an unusually premeditated depopulation event directed at China via a race-specific bio-weapon similar to previous bioterrorist attacks against the Chinese such as the 2002 SARS outbreak. Depopulation, authoritarian government and elimination of the elderly who no longer contribute tax money ... The coronavirus pandemic is currently on track to infect 60%–80% of the world's population and kill up to 15% of those infected.
Vaccination	COVID-19 pandemic is part of a mass-vaccination plot by big pharma to make huge profits	Several key advisors who urged WHO to declare a pandemic received direct financial compensation from the very same vaccine manufacturers who received a windfall of profits from the pandemic announcement. How One of Big Pharma's Most Corrupt Companies Plans to Corner the COVID-19 Cure Market.... vaccine companies in the United States, is set to profit handsomely from the current coronavirus crisis.
	Covid-19 vaccine implant nano-chip for surveillance and mass control	The #DeepState is hoping to get the #sheeple to show up at the local #Walmart to get #vaccinated and #MicroChipped in exchange for receiving 'DigitalWallets'. The Gates Foundation and their partners in Big Pharma wait in the wings with their offering of the ID2020 Alliance and its goal to microchip everyone on earth.
	COVID-19 vaccination is part of depopulation plan	#DepopulationGoals preponderance of the evidence: #BillGates: Develops Covid19 in his lab. Depopulation-via-vaccines enthusiast Bill Gates claiming you would need digital certificates and immunity passports to travel around again
	Vaccination makes people more susceptible to COVID-19	People who have had flu shots (elderly are probably the highest population to receive flu shots) would ironically be the most vulnerable. Chinese population is probably heavily vaccinated ... Pentagon Study shows Flu Shot Raises Risk of Coronavirus by 36%, and there's more ...

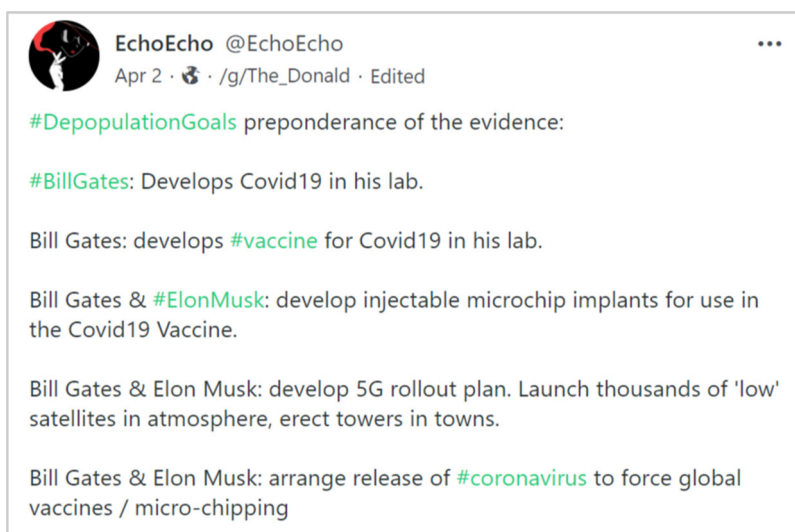


Figure 1. Screenshot of an example of a Gab post promoting multiple conspiracy theories.

posts. For a rigour check, a 10% random subsample was used for double coding. As calculated with Cohen's Kappa, the average inter-coder reliability was .73.

User Profile Analysis

User profile analysis was only conducted with Gab because 8kun users are anonymous and no profile data was available for us to conduct an analysis directly. In total, 2097 unique profiles are included in our Gab dataset. The user analysis serves to understand (1) the general characteristics of Gab users participating in the COVID-19 discussion and (2) who the influential actors are.

To achieve the first objective, 200 randomly sampled user profiles were manually coded by two trained coders. Building upon prior literature on Gab (Kalmar, Stevens, and Worby 2018; Zannettou et al. 2017; Zhou et al. 2019), the coding scheme includes three user dimensions: if the user profile is conspiracy theory-focussed, if it is conservative politics-focussed, and the self-reported location of the user. The coders were asked to analyse each profile description, the first page of the timelines, the pinned posts, and the images used. Coding was carried out by two trained research assistants. The average inter-coding reliability across these three dimensions was .69, as calculated using Cohen's Kappa.

For the second task, we conducted an in-depth qualitative profile analysis of the key actors. These actors were selected using three user metrics: follower count, repost count, and posting frequency. The distribution of posting frequency and repost count is shown in the scatter plot presented in Figure 2. Each point in the scatter-plot corresponds to a user profile, and it is sized according to the number of followers. Using these three metrics (0.99 quartile as the threshold), we identified the most followed, most active, and most reposted accounts in the dataset for the in-depth qualitative analysis. In total, 51 profiles were selected. To build detailed descriptive and informative profiles of these actors, two researchers conducted a multi-source and cross-platform investigation of each actor's presence in the media and their social media

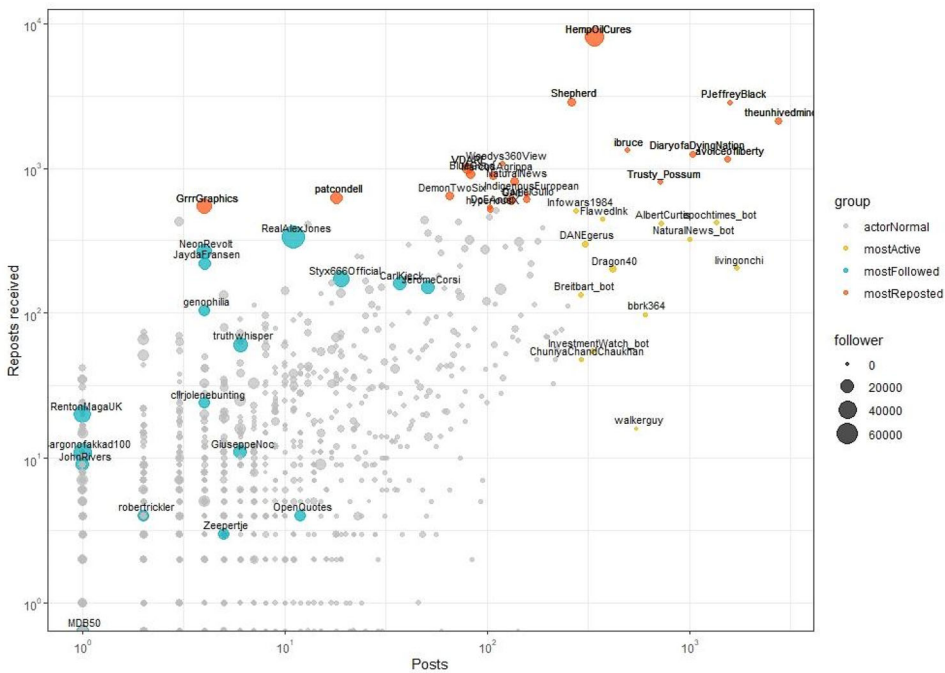


Figure 2. Scatter-plot of user metrics. Coloured actors were selected for profile analysis.

activities. Information collected and used for depicting these actors was recorded in detailed fieldnotes. Our examination of these selected actors is qualitative interpretation, and its rigour cannot be assessed by inter-coder reliability (Braun and Clarke 2013; Krippendorff 2004). Instead, the validity of our findings was ensured through in-depth engagement with available data we assembled and through the two researchers' detailed collaborative interpretation of these data (Yardley 2008).

Domain Analysis

To answer the third research question, we conducted a domain analysis for the external sources cited in two datasets. Overall, 53.9% ($N = 16,455$) of the COVID-19-related posts from 8kun and 81.44% ($N = 24,503$) of the Gab posts contain URLs linking users to external sources.

The domain data preparation consists of three main steps. First, we extracted all the URLs in both the Gab and 8kun corpora. In total, 17,248 and 22,128 links were extracted from 8kun and Gab respectively. In the second step, we recovered URLs that had been shortened using URL shortener tools. In the third step, all URLs were aggregated to the domain-level. In total, we identified 4,189 unique domains from 8kun and 2,355 from Gab. To identify the most cited sources, frequency analysis of the domains was conducted.

Moreover, to better understand the constructs of the information ecosystem on these two platforms, we conducted a network analysis to explore the co-occurring domains. Two different methods were used to generate the network data. Due to the length restriction, most gabs contain only one external URL. Therefore, we took an actor-based approach to construct the connection: an edge was given to two domains

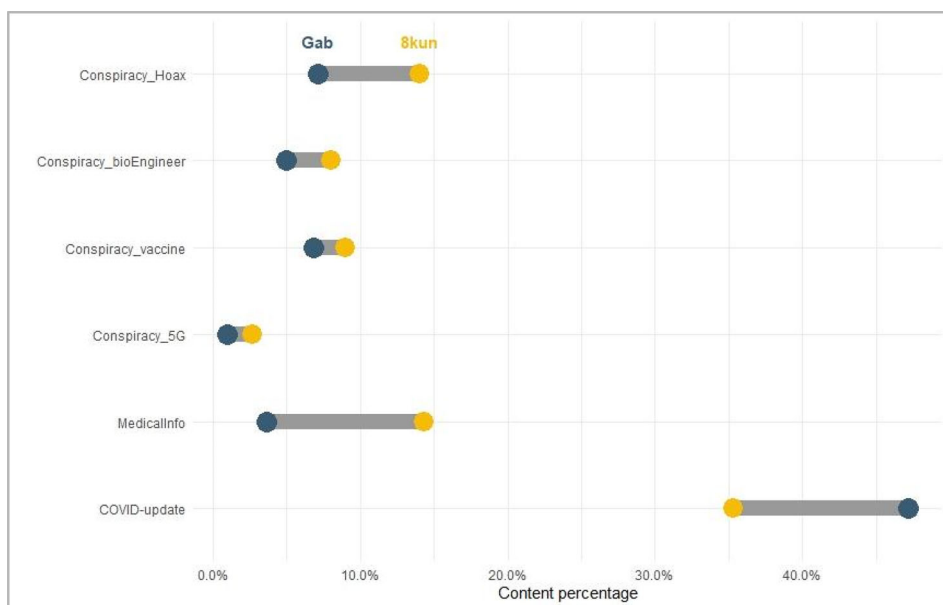


Figure 3. Distribution of six types of content on Gab (blue) and 8kun (yellow). The connecting lines between the dots represent the difference in the prevalence of conspiracy-theory-related content on the two platforms.

if they were posted by the same user. In the case of 8kun, because posts are longer and often include multiple links, we drew an edge between two domains if they appeared in the same posts. The software program, Gephi, was used to generate visualizations.

Findings

How Prevalent Are COVID-19-Related Conspiracy Theories on Dark Platforms?

On 8kun and on Gab, as shown in Figure 3, a large percentage of COVID-19-related content is news updates on the development of the pandemic, including case reports and government response (8kun = 35%, Gab = 47%). Discussion of medical (false) information about the virus and its treatments is much more common on 8kun (14%) than Gab (4%).

Conspiracy theories are featured in 38% and 24% of the COVID-related posts on 8kun and Gab, respectively. As noted in Section 3.3.1 (Table 1), the four most prevalent conspiracy theory themes are

- Hoax: conspiracy theories calling the pandemic a hoax, plotted by Democrats to prevent Trump from getting re-elected, or by globalists to implement a New World Order.
- 5G: conspiracy theories describing either the new coronavirus itself or its spread as being “5G-assisted”; other theories claim that the 5G signal is the real cause of sickness and death.

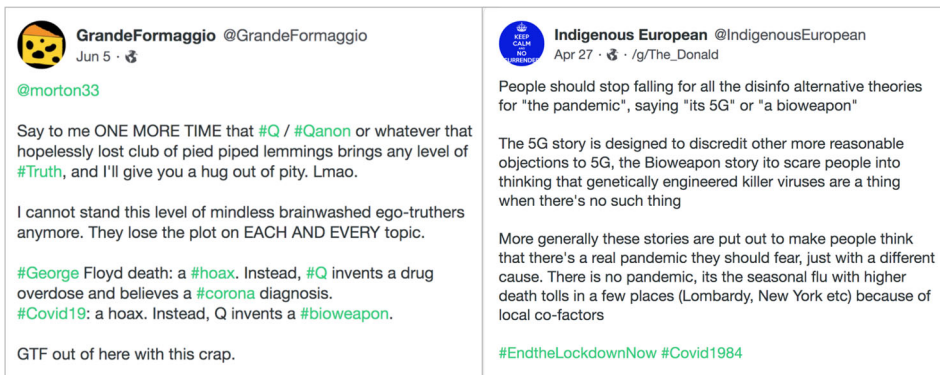


Figure 4. Examples of COVID-deniers refuting the bio-weapon and 5G conspiracy theories.

- Bio-engineered: conspiracy theories claiming that COVID-19 is man-made, either as a bio-weapon or part of a depopulation scheme.
- Vaccination: conspiracy theories connecting the pandemic with anti-vaccination narratives. Related theories range from accusing Big Pharma of manipulating the health crisis to push mass vaccination programmes to claims that the COVID-19 vaccine will be used to implant nanochips.

On both platforms, the most visible conspiracy theory category are claims that the pandemic is a “hoax”. They are promoted in 14% of the 8kun posts and 7% of the Gab posts. Another branch of popular conspiracy theories is related to vaccinations, which are mentioned in 9% of the 8kun posts and 7% of the Gab posts. Different versions of conspiracy theories promoting the idea that COVID-19 is bioengineered from a lab are visible in 8% of the 8kun posts and 5% of the Gab posts. Due to their sheer outlandishness and connection to the wider anti-5G movement around the globe, 5G-related explanations of COVID-19 have attracted a lot of media attention. Such theories are also visible in our data, but they are mentioned in only 2% of the 8kun posts and 1% of the gabs. From claims that 5G compromises immunity to the theory that COVID-19 is a mono-android activated by 5G signals, the eccentricity of these assertions vary.

Whereas some conspiratorial narratives about the pandemic are compatible (as exemplified in Figure 1), theories labelling the health crisis as a ‘hoax’ or a ‘false flag’ attack contradict many other theories. For this reason, in our data we have observed hoax conspiracy theorists debunking claims that COVID-19 is a bio-weapon or caused by 5G. In the examples shown in Figure 4, one Gab user debunks 5G and bio-weapon narratives with new conspiratorial explanations that these theories were proposed to delegitimise ‘reasonable’ conspiracism.

Who Are the Most Influential Actors?

Content Analysis of the Randomly Sampled Profiles

From the random sample of Gab users, 76% ($N=152$) of the accounts explicitly propagate conservative and far-right political ideology and 57% ($N=114$) of the profiles contain conspiracy theory content, such as QAnon and anti-vaccination rhetoric.

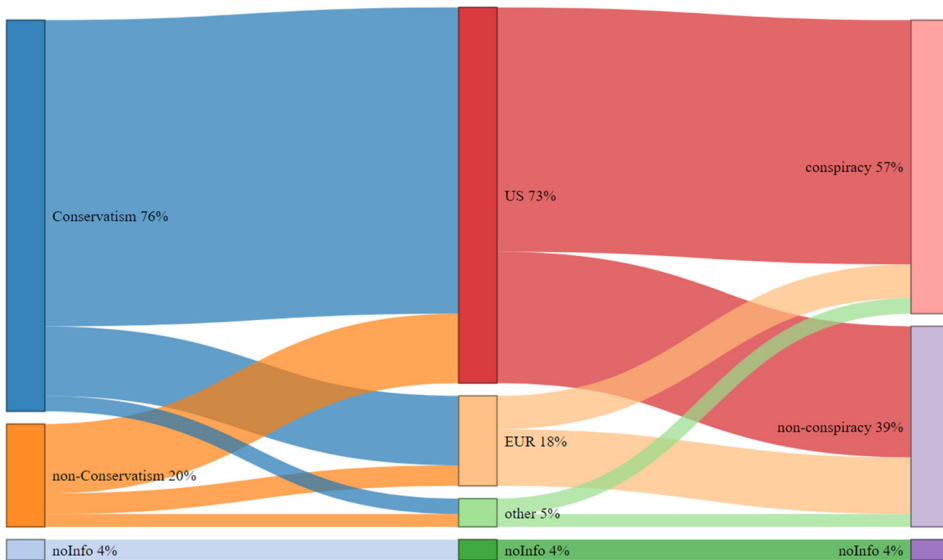


Figure 5. Sankey diagram showing the categorical composition of 200 random Gab profiles.

Note: from left to right, the columns represent the coding dimensions used in the content analysis: political stance, geo-location and conspiracy theory prevalence, respectively.

Regarding the user's geo-location, we found that 23% ($N=46$) of the profiles are explicit non-US accounts, among which 18% ($N=35$) are European. From the sample, eight profiles were either private profiles or profiles that no longer exist. The categorical composition of the profiles we analysed is presented in a Sankey Diagram in Figure 5. The thickness of the curved bands indicates the number of profiles under each subcategory.

Primary Actors

The COVID-19-commenting Gab profiles with the most followers are predominantly conspiracy theorists and right-wing activists from the US and the United Kingdom (UK). These individuals are opinion leaders, most of whom are "in exile" due to the crackdown and censorship imposed by major social media platforms. Figure 6 shows three examples of some of the *opinion leaders in exile*: Alex Jones, Jayda Fransen and Carl Benjamin.

- *Alex Jones* is a US conspiracy theorist who owns InfoWars, a multimedia website promoting conspiracy theories and other forms of misinformation. In 2018, Jones and InfoWars were banned from Twitter, Facebook, AppleStore and other major digital platforms.
- *Jayda Fransen* is a former deputy leader of the far-right group Britain First. She was active in pushing xenophobic and Islamophobic content on Twitter, some of which was even retweeted by Donald Trump. After Twitter permanently suspended her profiles for spreading hate speech in late 2017, Fransen moved to Gab. Fransen labelled the pandemic a hoax on her Gab account.
- *Carl Benjamin*, who goes by the name, Sargon of Akkad, on social media, is a vlogger and former member of the right-wing, populist UK Independence Party. Benjamin regularly promotes misogynistic, racist and inflammatory rhetoric, and he has been banned from platforms, including Twitter and the crowdfunding site

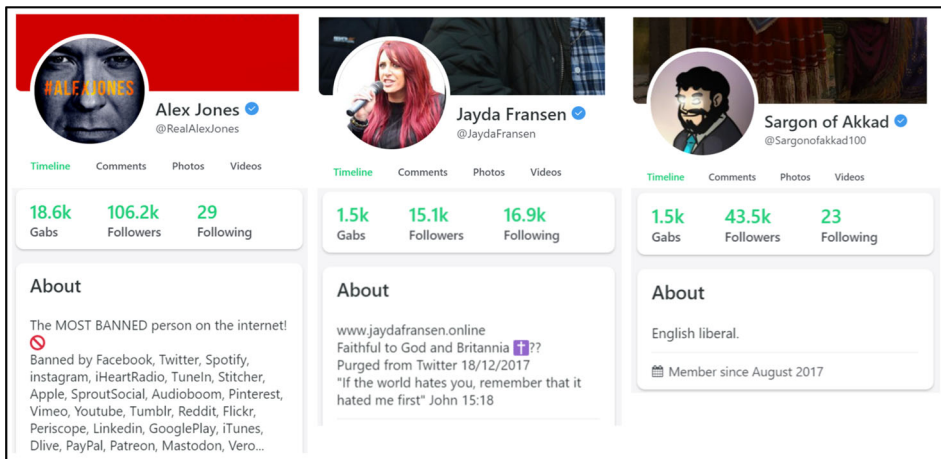


Figure 6. Screenshots of the Gab profiles of Alex Jones, Jayda Fransen and Carl Benjamin.

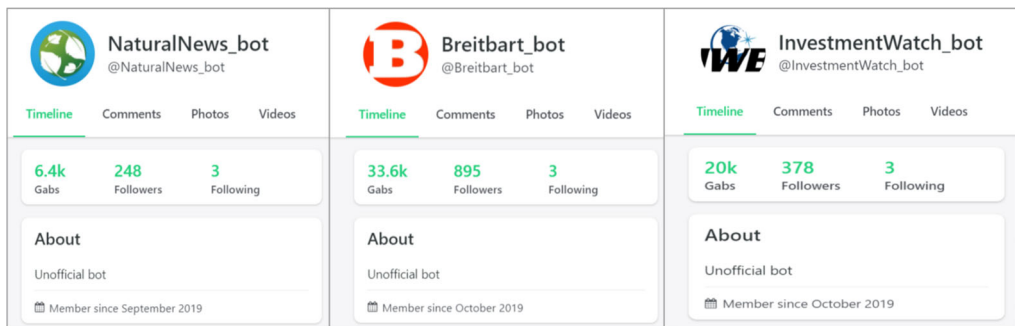


Figure 7. Screenshots of Gab profiles of unofficial bots.

Patreon. Benjamin has over 45,000 followers on Gab. With regards to the pandemic, he has shared videos mocking the UK government for its perceived over-reaction.

Throughout the pandemic, these accounts have provided regular extreme political commentary on local governments' responses to COVID-19, while promoting a host of conspiracy theories about the virus.

The top 1% ($n = 21$) of the most active profiles in the study alone contribute to 55% of all the content ($N = 16,738$) in the dataset. However, these accounts receive very little engagement, with an average of 1.4 likes received by each gab. After analysing the user-profile description and the engagement these accounts have with other Gab profiles³, we found that these profiles are mostly automated accounts set up to disseminate content from "alternative news" or unreliable news sources. Figure 7 presents three examples of fan bots for NaturalNews, Breitbart and Investment Watch Blog, respectively. One important feature of the self-declared bots accounts on Gab is that they are "unofficial" bots, meaning that they are not officially affiliated with the media outlets they represent. Instead, they were set up by Gab users or the platform itself.

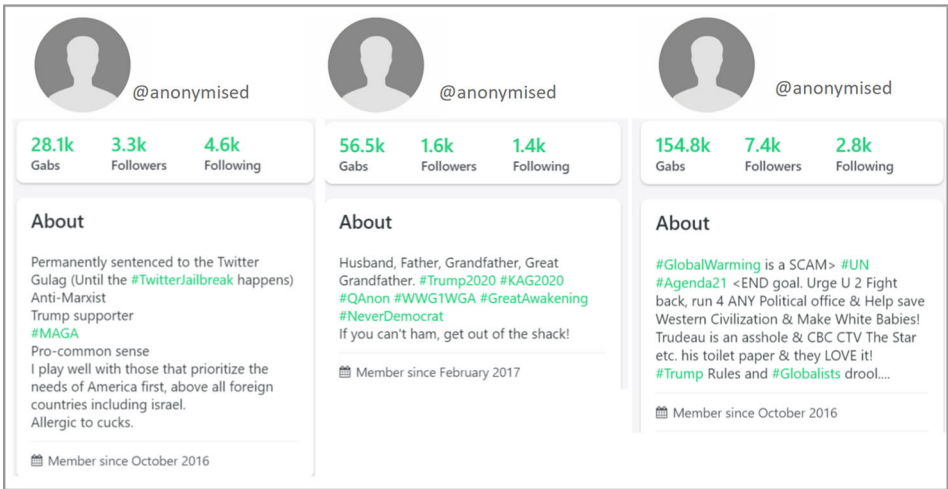


Figure 8. Example of Trump supporters. Username and profile pictures are removed.

Within the COVID-19-related discussion, the most reposted information comes from US-based Trump supporters (Figure 8). These groups of Gab users are also highly active posters (some profiles contributed over 1000 posts in the dataset). However, unlike the fully automated accounts mentioned above, these active users have a much larger followership and a traceable engagement with other users.

What Are the Key Information Sources Used in the Discussion and Conspiracy Theorising of COVID-19?

Domain Frequency Analysis

Findings from domain analysis of all COVID-related posts show that, YouTube and Twitter are among the top three most sourced websites on both Gab and 8kun (Figure 9). The former appears in 12% ($N=3,742$) of the 8kun posts and 15% ($N=4,397$) of the gabs. Twitter receives particularly high visibility on Gab, where it was cited in 12% ($N=3,652$) of the gabs; it was only mentioned in 6% of the 8kun posts ($N=2,501$). Another website that appeared regularly on both platforms was the far-right finance news website, ZeroHedge, which was cited 620 and 770 times on 8kun and Gab, respectively. ZeroHedge is infamous for making controversial commentaries on socio-political issues; during the pandemic, its Twitter account was suspended for propagating conspiratorial claims that blamed the Wuhan Institute of Virology for creating the novel coronavirus.

A comparison of the top domains also revealed disparities in 8kun and Gab users' information-sharing patterns. On 8kun, external sources are often shared in a more secretive manner, with the assistance of online storing and archiving tools. Some frequently used examples include docs.google, pastebin.com, scribd.com, mega.nz and archive.md. Unsurprisingly, QAnon-related sources are particularly popular in our 8kun dataset, and some of the most cited Q-themed websites are wearethene.ws and qnotables.com.

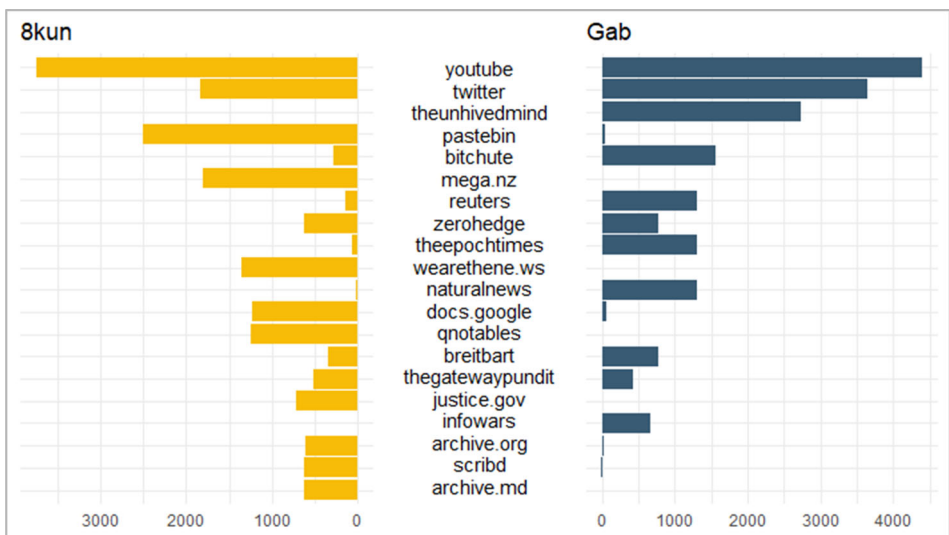


Figure 9. Bar charts comparing the most cited domains on 8kun and Gab.

Table 2. Ten most cited sources for each conspiracy theme.

5G			Hoax			Bioengineer			Vaccination		
1	Source	%	Source	%	Source	%	Source	%	Source	%	
2	YouTube	7.10	YouTube	6.80	YouTube	10.50	YouTube	10.60	YouTube	10.60	
3	Twitter	6.10	Twitter	5.00	The Unhived Mind	9.60	Twitter	6.40	Twitter	6.40	
4	videos.utahgunexchange	3.60	pastebin	2.50	InfoWars	5.80	Natural News	3.60	Natural News	3.60	
5	InfoWars	2.60	mega.nz	1.90	Twitter	4.40	InfoWars	3.60	InfoWars	3.60	
6	BitChute	1.40	Natural News	1.30	pastebin	4.10	BitChute	2.50	BitChute	2.50	
7	wearethene.ws	1.20	docs.google	1.20	mega.nz	2.70	archive.is	1.80	archive.is	1.80	
8	Qnotables	1.10	addons.mozilla.org	1.20	Natural News	2.70	news18	1.80	news18	1.80	
9	banned.video	0.90	BitChute	1.10	news18	2.40	ZeroHedge	1.70	ZeroHedge	1.70	
10	ncbi.nlm.nih.gov	0.70	wearethene.ws	1.00	ZeroHedge	2.00	pastebin	1.30	pastebin	1.30	

In contrast, Gab users who shared more far-right “fake news” websites are relatively more visible on Gab. Some of the most cited sources under this category include the Unhived Mind ($N = 2,729$), Epoch Times ($N = 1,303$), Natural News ($N = 1,301$), Breitbart ($N = 769$), the Gateway Pundit ($N = 422$), and InfoWars ($N = 656$).

When breaking down the domain frequency by conspiracy theory themes, YouTube is the most frequently cited source across all four categories (Table 2). For instance, on the topics of vaccination and bioengineer over 10% of the posts from 8kun and Gab include YouTube videos. Video content from the dark equivalents of YouTube, such as bitchute.com and banned.video, was also regularly mentioned in the discussion of these conspiracy theories.

Domain Network Analysis

To identify the co-occurring domain clusters, we used Blondel et al. (2008) algorithm to identify high modularity partitions, with the default modularity resolution of 1. Based on the modularity class, different colours were used to differentiate the top six clusters identified by this algorithm (Figure 10). The diagrams include the top six clusters from each network that include over 2% of the nodes. Through qualitative

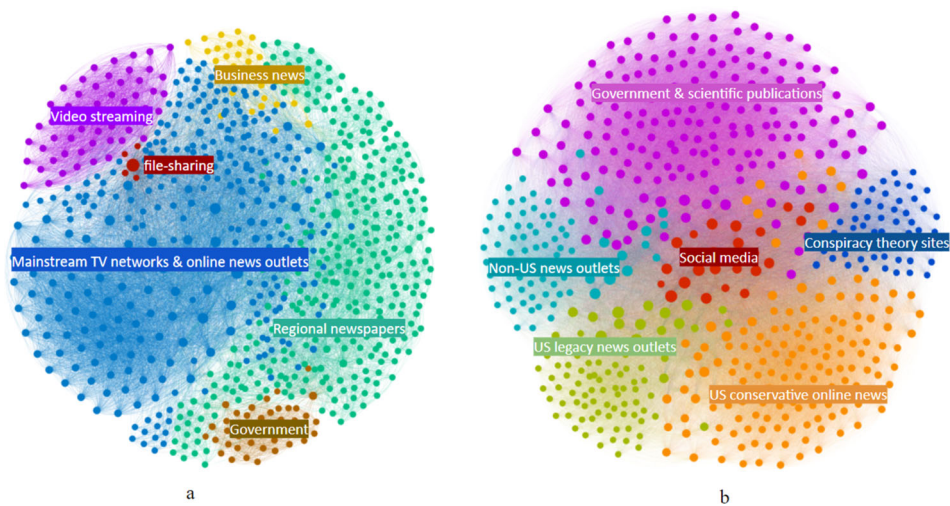


Figure 10. Networks of co-occurring domains on 8kun (a) and Gab (b). For the sake of readability of the graph, only six clusters from each network with the most nodes are included.

Table 3. Major clusters of the two domain networks.

	Modularity class	Label	Example	Nodes	Avg degrees
8kun	Mk03	Mainstream TV networks & alternative online news outlets	foxnews.com, bbc.uk	1,612	17.45
	Mk18	Regional newspapers	detroitnews.com, startribune.com	621	22.22
	Mk33	Business news	markets.businessinsider.com, businessworld.in	91	15.65
	Mk14	Government	michigan.gov, gov.louisiana.gov	86	23.68
	Mk01	File sharing	docs.google.com, mega.nz	66	14.73
	Mk00	Video streaming	vimeo.com, streamable.com	63	10.8
Gab	Mg04	Social media	youtube.com, twitter.com	676	44.3
	Mg00	US conservative online news	americanthinker.com, westernjournal.com	232	146.45
	Mg03	Government & scientific publications	cdc.org, sciencemag.org	225	246.13
	Mg09	International news outlets	theguardian.com, bbc.com	221	103.59
	Mg01	US legacy news outlets	bloomberg.com, wsj.com	162	127.33
	Mg05	Conspiracy theory outlets	naturalnews.com, pandemic.news	124	94.12

inspection of notes with the highest centrality rank in each cluster, we distinguished and labelled each cluster by the most common types of domains (Table 3).

Figure 10 was generated in Gephi with a ForceAtals2 layout, with visual optimization using strong gravity. Modularity classes were used as the nodes partition parameter for colouring. Modularity is a scalar value measuring the quality of the partitions by comparing the density of the links from inside the module (domain clusters in this case) with that in a random network structure (Newman 2006).

Unlike frequency domain analysis, which indicates that the most cited sources on Gab and 8kun are social media and alternative news/conspiracy theory sites, the domain network provides a broader picture of the information ecosystem. Despite the dark nature of Gab and 8kun and the prevalence of conspiracy theories on these platforms, mainstream news outlets are very prevalent in both networks. Some of the regularly cited sources include [reuters.com](https://www.reuters.com), [bbc.com](https://www.bbc.com) and [theguardian.com](https://www.theguardian.com). Moreover, on both platforms, the cluster of official information sources from governmental and science institutions (Mk14, Mg03) have the highest average degree of centrality. Within these clusters, WHO, CDC and prestigious scientific publications (e.g. [thelancet.com](https://www.thelancet.com) and [sciencemag.org](https://www.sciencemag.org)) are among the most cited sources.

Discussion

Hotbed of Conspiracy Theories

Although similar studies have shown that false claims about COVID-19 are also highly visible on major social media platforms (e.g. Evanega et al. 2020, Kouzy et al. 2020), the profusion of deceptive information, especially conspiracy theories, is much greater on 8kun and Gab. When comparing Gab and 8kun, we found that the latter propagates more conspiracy theories. The higher visibility of conspiracy theories on 8kun should be interpreted in relation to its platform affordance and platform culture. As mentioned before, 8kun let users publish contents anonymously. This anonymity, coupled with minimal content governance, has encouraged the prevalence of toxic content, including conspiracy theories. When it comes to Gab, the microblogging service presents itself as the censorship-free alternative to Twitter, which is largely used as a “broadcasting” tool for sharing news and information. This explains why almost half the COVID-related posts were updates about the development of the pandemic. Unlike 8kun wherein lengthy posts are a common occurrence, Gab’s short format also limits its potential to serve as a locale for elaborating conspiracy theories.

Conspiracy theories proliferating during a pandemic is neither new nor surprising. COVID-related conspiracy themes identified in this study reveals the particular social and political functions of conspiracy theories during public health crises. As previously mentioned, conspiracy theories function as a threat management response and a sense-making mechanism, these tendencies make health crises particularly susceptible to conspiracism (Van Prooijen and Jostmann 2013). In the absence of a conclusive explanation of COVID-19’s origin, prevention and cure, conspiracy theories emerged to fill the epistemic gap. Furthermore, the recent rise of populism has fuelled the weaponization of conspiracy theories to delegitimise established political powers and science communities (Mede and Schäfer 2020). For instance, the popularity of theories claiming that the pandemic is a hoax and that the virus is bio-weapon from China should be interpreted in relation to populism in the US, where most Gab and 8kun users are based. As previously mentioned, Trump supporters are prominent actors participating in COVID-related discussion on dark platforms. Their rhetoric around the pandemic was in large part shaped by the 2020 US presidential election and the Sino-US trade war. Some, for example, promoted claims that China staged the health crisis in order to manipulate the trade war against the US; others claimed that the US

Democratic party and their “fake news” media allies have consistently exaggerated the severity of the virus in an attempt to undermine Trump’s Presidency. While attempts to explain crises through scapegoating “the other” (Democrats and China) is a common response to crisis (Bordia and DiFonzo 2005), throughout the COVID-19 health crisis, such rhetoric is also being used to advance political agendas.

Dark Participants

As mentioned earlier in this article, conspiracy theorizing in the digital environment can be perceived as a form of dark participation, wherein individuals collectively make sense of perceived threats and uncertainties. Users of 8kun and Gab, as shown in the example of COVID-related discussion, performed intellectual labour to collaboratively curate information from a wide variety of sources to formulate explanations about the pandemic. Although our user profile analysis showed that these participants are largely homogenous and overwhelmingly conservative-leaning, we should not depict conspiracy theorists as a monolithic group of people. Our findings not only revealed the wide geographical distribution of users (on Gab) but also illustrates contestations between conspiracy theorists. For example, theories denying the seriousness or existence of COVID-19 are the most popular category identified in our study, however, they also routinely contradict one another and other COVID-19 conspiracies. As discussed earlier, many of those who declared the pandemic “a hoax” also participated in debunking 5G and bio-weapon theories.

Where influential actors are concerned, there are big disparities between dark platforms and major social media. Related studies on Twitter and Facebook suggest that (alternative) media accounts played a crucial role in spreading false claims about COVID-19 (Yang et al. 2020). On dark platforms, the presence of such accounts is largely absent. Our analysis of primary actors on Gab identified numerous “dark influencers” who have been suspended by Facebook and Twitter, many of whom are *conspiracy entrepreneurs* (Sunstein and Vermeule 2009, 212) who profit from and monetize their visibility on social media. After being banned by major platforms, dark platforms provide refuge to these conspiracy theories, and in return they facilitate dark platforms’ recruitment of new members. Moreover, these actors use their exiled status to gain credibility on dark platforms. From Alex Jones’s self-marketing as “the most banned person on Internet”, to Jayda Fransen’s “purged from Twitter 18/12/2017” declaration (Figure 6), it has become customary for conspiracy theorists and far-right activists to use their “pariah” status as a form self-branding.

While attention and profit-seeking conspiracy entrepreneurs prevail on Gab, anonymous conspiracy theorists on 8kun remain largely mysterious. One characteristic of their participation in constructing conspiratorial explanations of the pandemic is their high degree of coordination. 8kun users included in this study, or Anons, collaboratively construct conspiracy theories about COVID-19 based upon messages from Q (or “Q drops”). Using Anon’s own language, this process of assembling information into coherent conspiracy narratives is called “baking” (Zuckerman 2019). “Bakers” have to follow standardized forms of communication in the community, and detailed instructions are regularly shared on 8kun to teach new Anons how to properly “bake”.

This degree of formality and standardization provide a high threshold for newcomers, preventing dark participation in this online locale from going mainstream. To a large extent, the participation in conspiracy theorizing on 8kun remains largely a form of subculture, or a *cultic milieu* (Campbell 2002 [1972]). Despite their fringe nature, the impacts of such conspiratorial cultic milieus on 8kun and other anonymous forums should not be overlooked. On these platforms, conspiracism is closely interlinked with a further-reaching and more visible toxic culture that promotes extremism, hatred and violence. For example, following the 2020 US presidential election, claims declaring the results as “rigged” flourished on 8kun and many members subscribing to these theories then used the platform to mobilize and plan for the subsequent storming of the US Capitol building (Collins and Zadrozny 2021).

Parallel Information Ecosystem

When compared to findings from studies examining the sources of COVID-related information on mainstream popular social media sites (Cinelli, Quattrociocchi, and Galeazzi 2020; Yang et al. 2020), our study shows that low-credibility sources are much more prevalent on dark platforms. Moreover, results from our domains analysis revealed a “darker” information ecosystem that runs parallel to more established and authoritative information sources. To circumvent censorship on major platforms, 8kun and Gab participants use under-the-radar tools to share information. For instance, rather than YouTube, “dark equivalents” (e.g. BitChute.com) can be used to disseminate controversial videos. Likewise, rather than citing online posts/articles directly, archiving portals or pastebin sites were deployed to bypass censorship and maintain anonymity. Despite the existence of a parallel darker information ecosystem, dark platforms are not free from the influence of their mainstream counterparts. As shown in our domain network analysis, Gab and 8kun and their mainstream counterparts are interlinked. Both major social media sites (Twitter and YouTube) and legacy media are regularly cited by Gab and 8kun users. These findings provide important insights into the media diets of dark platform users. The prevalence of legacy and authoritative information sources provide evidence to support Bruns (2019) critique on filter bubbles. As Bruns (2019) argued, participants on a given platform may form highly homophilous communities, but at the same time they remain embedded in the hybrid media ecology and encounter a broad range of information.

To acknowledge dark participants’ engagement with broad media ecology is particularly informative for our understanding of conspiracy theory epistemology. Sunstein and Vermeule (2009, 204) attributed conspiracy theories to the so-called “crippled epistemology”, which they argued is a result of a “sharply limited number of (relevant) informational sources”. In a similar vein, Barkun (2013, 8) argued that conspiracy theorists dismiss mainstream media sources to avoid the “mind control and brainwashing used to deceive the majority”. In contrast to their observations, the current study reveals the consumption of a wide range of media sources, including legacy media reports and scientific publications. This implies that the interplay between conspiracy theories and authoritative narratives is dynamic and complex. As Munn (2019) stated, for conspiracy theorists to achieve intellectual legitimacy, they also have to

actively engage with authoritative and scientific narratives. To better understand how these narratives could be utilized, or hijacked, to support conspiracism, future research should examine the context of conspiracy theorists' citing of authoritative sources.

Furthermore, as mainstream social media sites tighten their platform governance, an increasing number of controversial figures and their followers will be forced into the darker spectrum. For example, while this article was being written, Donald Trump, who has been permanently banned from Twitter and Facebook is reportedly attempting to crawl his way back onto social media through dark platforms (Brown 2021). Alongside joining existing social media platforms, another growing trend is for these personnel in exile to retreat into closed communication, such as through re-deploying old-fashioned mailing lists or developing their own apps. These trends further divide and polarize the online space, dispersing conspiracy theorists into fragmented online locales. In the context of conspiracy theories, experiences of ostracism could make people more likely to hold conspiracy beliefs (Graeupner and Coman 2017), and at the same time render the already challenging task of refuting them even more difficult. Future studies should empirically evaluate the impacts of this trend. Although the current study exclusively examined Gab and 8kun, dark platform as a concept can be used as a heuristic device for researching a wider range of under-the-radar platforms.

Notes

1. QResearch retrieve posts based on keyword detection, so we can use the term 'covid' to retrieve data related to the study. In contrast, garc's hashtag search function returns post with exact hashtags. For this reason, we could not use the same term – "covid" – to collect Gab posts.
2. This refers to the point when new data does not yield new observations or insights—in our case thematic categories.
3. The Comments section in Gab profiles allows us to inspect the users' interactions with others. In addition to content type, profile description and posting frequencies, we used the (lack of) engagement to assess how likely it is that the profile is automated.

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ORCID

Jing Zeng  <http://orcid.org/0000-0001-5970-7172>

Mike S. Schäfer  <http://orcid.org/0000-0002-0847-7503>

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